

Attorney Docket No. C2397 COGG
Serial No. 10/075,726
Art Unit: 1743
Applicants' Response to the Office Action dated December 9, 2005

REMARKS/ARGUMENTS

Amendment of the Claims

Entry of the amendments to 1, 3, 6, 8-11, 13-16, 19 and 20; addition of new claims 21-24; and cancellation of claim 18 (without prejudice) in accordance with the above Listing of Claims is respectfully requested. Upon entry of the amendments and new claims, claims 1-17 and 19-24 will be pending in the application.

Independent claims 1 and 20 are amended by changing the phrase "having at least two different forms of microreaction channels" to "having at least two different geometric forms of integral microreaction channels". Support for this amendment is found in the first sentence of paragraph [0006] of Applicants' specification.

Independent claims 1 and 20 are also amended to read: "at least one inlet for one or more reaction educts, and at least one outlet for one or more reaction products". Support for this amendment is found in paragraphs [0005] and [0011] of the specification.

Independent claims 1 and 20 are also amended to change the wherein clause at the end to read: "wherein two or more of the at least two different geometric forms of microreaction channels are suitable for operation independently of one another", instead of "wherein each of the channels is suitable for operation independent of the other". Support for the new wording of these wherein clauses is found in paragraph [0005] which states "and can be operated or used independently of one another".

Dependent claim 3 is amended to replace "reaction space channels" with "microreaction channel" to agree better with claim 1.

Dependent claim 6 is amended to refer to "geometric forms of integral", as in amended claim 1 and to delete the redundant wording from claim 1 at the end.

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Dependent claim 8 is amended to add that only "one or more" of the reaction spaces have one or more mixing points. This amendment is supported in paragraph [0011] and in Table 1 [particularly footnote c)].

Dependent claim 9 is amended to indicate that the "channels" are "microreaction channels"; that the "at least two inlets" are "for at least two reaction educts" as in the amendment to claim 1; and to delete the reference to mixing angles.

Dependent claim 10 is amended to refer to the mixing angles deleted from claim 10, instead of having "one or more mixing points" (which is now redundant of amended claim 8).

Dependent claim 11 is amended to change "the chip reactor" to "at least a portion of the carrier". Dependent claim 11 is also amended to identify the "two more zones" as "mixing, reaction, heating or cooling zones". New claim 21, dependent on claim 20, also refers to "two or more mixing zones, two or more reaction zones, two or more mixing and reaction zones, two or more cooling zones or any combinations thereof". New dependent claim 22 is dependent on new claim 21. Support for these amendments and the related portions of new claims 21 and 22 is found in the specification in paragraph [0006] at page 2, lines 18-23, and in paragraph [0011] at page 4, lines 16-23.

Dependent claim 13 is amended to refer to "at least one inbound passageway" rather than to "an inbound passageway" and to refer to "at least one outbound passageway" rather than to "an outbound passageway". Dependent claim 13 is also amended to state that the inbound and outbound passageways are "connect to" rather than "correspond to" the inlet and outlet. Support for this amendment is found in the specification in paragraph [0013] beginning on page 6 through page 7, line 3, and in Figure 2 which shows (manifold) passages for "Educt 1", "Educt 2" and "Educt 3".

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Dependent claim 15 is amended to indicate that the "at least one passageway for a heat transfer liquid" is "in thermal contact with at least one microreaction channel" for clarity.

Dependent claim 19 is amended to refer to "different geometric forms" as in amended claim 1. The wherein clause of dependent claim 19 is amended to refer to "the different microreaction channels" for greater clarity. The redundant wording of claim 1 is deleted for clarity.

In addition to the amendments to independent claim 20 noted above with the discussion of the amendments to claim 1, claim 20 is amended to indicate that "the silicon/glass composite carrier" is a "wafer". Independent claim 20 is also amended to delete "from 5 to 50 different geometric forms" and to replace it with "having at least two different geometric forms" so that claim 20 is the same as claim 1 in this respect. Claim 20 is also amended to delete the reference to the "and a facility for visual inspection of the chip reactor" at the end of the claim.

New dependent claims 21 is discussed in connection with the amendments to dependent claim 11 above.

New dependent claim 22 corresponds to original claim 12.

New dependent claim 23 corresponds to dependent claim 8, discussed above.

New dependent claim 24 corresponds to amended dependent claim 9, discussed above.

Applicants submit that the amendments add no new matter and are properly supported by the original specification (and claims). Entry of the amendments to 1, 3, 6, 8-11, 13-16, 19 and 20 and addition of new claims 21-24 in accordance with the above Listing of Claims is deemed properly and is respectfully solicited.

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Withdrawal of Rejection for Obviousness-Type Double Patenting

Applicants thank the examiner for reconsideration and withdrawal of the rejection for obviousness-type double patenting of claims 1-20 over claims 11-20 of co-pending application No. 10/076,736 (characterized by US 2002/0192118).

Rejection for Anticipation

In the subject first Office Action in this continuing examination, the Examiner maintains the rejection of claims 1-6, 8 and 10-20 under 35 U.S.C. §102(e), as being anticipated by U.S. Patent Application Publication No. 20020014106A1 of Srinivasan, et al. (hereinafter referred to as "Srinivasan et al."). The Examiner refers to the statement of the rejection in the office action of September 14, 2004, which is as follows:

"Srinivasan et al. discloses a microfabricated microdetection array made of a glass/silicon composition, the array having a plurality of reaction spaces. Paragraph [0046] of Srinivasan discloses the use of a silicon dioxide coating having a thickness "indistinguishable from the claimed range."

The present rejection then states further:

"The 9/26/05 amendments introduce limitations to the channels having 'at least two different " forms where each channel is suitable for independent operation.

Srinivasan et al. teach in paragraph [0015] the test catalyst in each column is different which has been read on the claimed 'at least two different forms'."

(Underlining added)

In accordance with the foregoing amendment of claims 1 and 20, Applicants' claimed invention is now more clearly directed to chip reactors comprising a carrier having at least two different geometric forms of integral microreaction channels, each of the channels comprising at least one reaction space, at least one inlet for one or more reaction educts, and at least one outlet for one or more reaction products, wherein two or more of the at least two different

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geometric forms of integral microreaction channels are suitable for operation independently of one another.

Applicants respectfully submit that the examiner's rejection for anticipation is wholly inadequate as it does not provide applicant with reference to specific portions of the description and drawings of Srinivasan et al. which teach each element of applicants' independent claims 1 and 20. MPEP 706.02 states:

"706.02 Rejection on Prior Art [R-3]

IV. DISTINCTION BETWEEN 35 U.S.C. 102 AND 103

The distinction between rejections based on 35 U.S.C. 102 and those based on 35 U.S.C. 103 should be kept in mind. Under the former, the claim is anticipated by the reference. No question of obviousness is present. In other words, for anticipation under 35 U.S.C. 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present. Whereas, in a rejection based on 35 U.S.C. 103, the reference teachings must somehow be modified in order to meet the claims. The modification must be one which would have been obvious to one of ordinary skill in the art at the time the invention was made. See MPEP § 2131 - § 2146 for guidance on patentability determinations under 35 U.S.C. 102 and 103."

(Underlining added)

Applicants submit that the examiner's rejection first stated in the office action of 9/14/04 and continued in each successive office action, fails to provide applicants with any description of where their invention is disclosed in the allegedly anticipatory reference. Accordingly, the rejection simply fails to establish that the reference "teaches every aspect of the claimed invention". The Srinivasan et al. reference has 23 pages of text referencing 43 sheets of drawings. A rejection that simply tells applicants "its in there somewhere" is not a proper rejection. Applicants are not required to search through the reference for the portions of the disclosure which might disclose their invention. That is the examiner's duty. It is also his duty to state specifically where in the invention is disclosed.

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The examiner has only referred to two specific paragraphs of Srinivasan et al. In the office action of 9/14/04, he referred to paragraph [0046], as disclosing the "use of a silicon dioxide coating having a thickness "indistinguishable from the claimed range", but what claim this referred to is not stated. (Paragraph [0046] does not pertain to either independent claims 1 or 20.)

In the present office action, the examiner referred to paragraph [0015] of Srinivasan et al. as teaching that "the test catalyst in each column is different which has been read on the claimed 'at least two different forms'" The examiner also states that the Office reads 'at least two different forms' as pertaining to any difference in the channel, such as different types of catalyst loaded in the channel. This is contrary to the definition of "form" in paragraph [0006] of applicants' specification. The Office cannot impose its own definition over applicants clear definition. The examiner also notes that the different types of catalyst in the column also have different geometric arrangements within the columns. Applicants submit that this does not constitute a structural reaction space, particularly an integral one as now embodied in applicants' claims 1 and 20.

Paragraph [0015] of Srinivasan et al. states:

"[0015] The invention is additionally directed to methods for evaluating the catalytic performance of candidate catalysts. Four or more candidate catalysts are simultaneously contacted with one or more reactants in a parallel reactor under reaction conditions to catalyze at least one reaction, and the resulting reaction products or unreacted reactants are detected in parallel with the gas chromatographs of the invention, as described or claimed herein, to determine the relative performance of the candidate catalysts. The candidate catalysts can be the same or different between reaction channels, and the reaction conditions (e.g., temperature, pressure, feed flowrate, residence time, feed composition) can likewise be the same or different between reaction channels."

(Underlining added)

Applicants submit that the examiner's reference to the "candidate catalysts" in the columns as providing different forms of reaction spaces in microreaction channels, demonstrates that the examiner has not fully analyzed the reference with respect to applicants' claimed invention. The

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disclosed devices of Srinivasan et al. comprise a number of reaction vessels (see paragraph [0011]) connected for analytical purposes to one or more chromatography columns for separating constituents of a mixture in combination with an array of microdetectors for each column.

Applicants submit that neither the disclosed chromatography columns nor the microdetectors channels constitutes "a chip reactor comprising a carrier having at least two different geometric forms of integral microreaction channels, each of the channels comprising at least one reaction space, at least one inlet for one or more reaction educts, and at least one outlet for one or more reaction products. The columns are not in the form of a chip and they do not have multiple integral microreaction channels. The array of microdetectors do not have a reaction space as no reaction takes place in them. Nor, does a given array of microdetectors channels have a different geometric form.

The parallel flow reactors, as described in paragraph [0011] of Srinivasan et al., "can be typical bench scale, or smaller scale, such as massively-parallel microreactors (e.g., as described in WO 00/51720) or intermediate scale parallel-flow reactors . . ." Thus, it is clear that neither the chromatography columns nor the microdetectors of Srinivasan et al. is a "reactor". The "massively-parallel microreactors" parallel flow reactors" are presumed to be those that the examiner herein also found in his prior art search.

The first sentence of paragraph [0017] of Srinivasan et al. states: "The parallel detection systems disclosed herein, comprising a microdetector array, overcome the substantial cost and space constraints of conventional gas chromatographs."

The essence of the present applicants' invention is set forth in paragraph [0007] of the Specification,

"Accordingly, the new chip reactor makes it possible - by problem-free actuation of the individual microreaction spaces - to test a number of possible forms of microreaction systems for their suitability for liquid-phase reactions and optimization of the test results so that a number of experiments can be carried out far more quickly and with less outlay."

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Accordingly, applicants submit that the examiner has not shown that Srinivasan et al. discloses every element of the claimed chip reactor. Applicants therefore respectfully request reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. §102(e).

Rejection for Obviousness

In the Final Office Action, the Examiner maintains the rejection of claims 7 and 9 under 35 U.S.C. §103(a), as being unpatentable over Srinivasan et al., again referring to the office action of September 14, 2004. Therein, the Examiner contends that, while Srinivasan is silent as to the length of a reaction channel and the mixing angle, that such elements are simply the routine optimization of result-effective variables. On that basis, the Examiner argues that the claims are obvious. Applicants respectfully disagree and request reconsideration and withdrawal of the rejections.

As noted above, neither the chromatography columns nor the microdetectors of Srinivasan et al. is a "reactor". Srinivasan et al., at paragraph[0097], states: "The parallel reactor can be of any type known in the art." In other words, the reference does not discuss modification of known parallel flow reactors. Thus, there is no motivation from the cited reference itself to modify parallel flow reactors known in the art in any manner.

Accordingly, Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness of claims 7 and 9 based upon Srinivasan et al. Withdrawal of the rejection is therefore respectfully requested.

There are no further rejections in the subject Office Action. It is believed that the foregoing amendment to the claims and reply are completely responsive under 35 CFR 1.111 and that all grounds of rejection are completely avoided and/or overcome. Applicants therefore respectfully request that a timely Notice of Allowance be issued in this application.

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The Examiner is requested to telephone the undersigned attorney if any further questions remain which can be resolved by a telephone interview

Respectfully submitted,

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(Date)

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